CLAIMS

1.   A permanent magnet synchronous motor having a stator with a concentrated winding is characterized in that:

5   a relation of 0.3 Lg < La $\leqq$ 2.0 Lg is established,
             where La is a clearance between teeth of the stator; and
                   Lg is an air-gap between the stator and a rotor.

2.   A permanent magnet synchronous motor having a stator with a
10   concentrated winding is characterized in that:
             a relation of 2 Lg < Lb < 5 Lg is established,
             where Lb is a depth of a tooth edge; and
                   Lg is an air-gap between the stator and a rotor.

15   3.   A permanent magnet synchronous motor having a stator with a
concentrated winding is characterized in that:
             relations of 0.3 Lg < La $\leqq$ 2.0 Lg, and 2 Lg < Lb < 5 Lg are
established,
             where La is a clearance between teeth of the stator;
20   Lb is a depth of a tooth edge; and
                   Lg is an air-gap between the stator and a rotor.

4.   A permanent magnet synchronous motor having a stator with a
concentrated winding is characterized in that:
25   an edge section on at least one end of a tooth, said edge section
facing to a rotor, is cut away.

5.   The permanent magnet synchronous motor as defined in Claim 4,
wherein an edge section on one of end of adjacent teeth, said edge section
30   facing to the rotor and being on a trailing end with regard to a rotating
direction of the rotor, is cut away.

6.   The permanent magnet synchronous motor as defined in Claim 4
wherein, at the end of the tooth where the edge section is cut away, another
35   side edge to the rotor is protruded for maintaining a depth of the end of the
tooth.

7.   The permanent magnet synchronous motor as defined any one of
claims 1 through 6 wherein a permanent magnet in the rotor comprises a
40   ferrite magnet.

8.   The permanent magnet synchronous motor as defined any one of
claims 1 through 6 wherein the stator comprises a divided core.

9. A permanent magnet synchronous motor having a stator with a concentrated winding is characterized in that:

outer walls on both end sections in a rim direction of a permanent magnet disposed inside a rotor along a rotor rim are tapered 5 inward from the rotor rim in a radial direction and form a recessed section.

10. The permanent magnet synchronous motor as defined in Claim 9 wherein a relation of $(1/10)As < Am < (1/4)As$ is established,

where "Am" is an opening angle of a recessed section with 10 regard to a center of the rotor; and

"As" is an opening angle of teeth of the stator.

11. The permanent magnet synchronous motor as defined in Claim 9 wherein an inner wall of the permanent magnet facing a radial direction is 15 flat face for increasing a depth of a center section of the permanent magnet in the rim direction.

12. The permanent magnet synchronous motor as defined in Claim 9 wherein the permanent magnet is mounted on an outer wall of a rotor core, 20 and a recessed section is formed at an open space from where both the end sections of the permanent magnet are cut away in the rim direction.

13. The permanent magnet synchronous motor as defined in Claim 9 wherein the permanent magnet is buried in a rotor core along a rotor-core 25 rim, and a cut-away section is formed at a section corresponding to both the end sections of the permanent magnet in the rim direction.

14. The permanent magnet synchronous motor as defined in Claim 9 wherein the permanent magnet is buried in a rotor core along a rotor-core 30 rim, and a slit is formed at a section corresponding to both the end sections of the permanent magnet in the rim direction.

15. A permanent magnet synchronous motor having a stator with a concentrated winding is characterized in that:
35 a reversely arced permanent magnet having a curvature-center outside a rotor in a radial direction is buried in a rotor core along a rotor-core rim, and a magnet-end facing to a rotor rim is situated inside the rotor rim in a radial direction, and a slit is formed on the rotor at a section corresponding to the magnet-end.
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17. The permanent magnet synchronous motor as defined in Claims 15 or 16 wherein a relation of $Lg < Q < 3 Lg$ is established,

where Q is a distance between the end of the permanent magnet and the rotor-core rim; and

Lg is an air-gap between the stator and the rotor.

18. The permanent magnet synchronous motor as defined in Claims 15 or 16 wherein a relation of $(1/10)As < Am < (1/4)As$ is established,
where "Am" is an opening angle over a width of one of the cut-away section and the slit corresponding to the end of the permanent magnet with regard to a rotor center; and
"As" is an opening angle of teeth of the stator.

19. The permanent magnet synchronous motor as defined in any one of the preceding Claims wherein said motor is driven in a sensor-less operation.

20. A compressor used in one of an air-conditioner and an electric refrigerator driven by the motor as defined in any one of the preceding Claims.